REMARKS

The Applicants greatly appreciate the swift and courteous final Office Action, and especially appreciates the Examiner's time during the teleconference with the undersigned Applicants' attorney on June 6, 2006 during which the Action was discussed. The Applicants are also grateful for the withdrawal of the anticipation rejection under 35 U.S.C. §102(f).

Claims 1-3, 6, 7, 10-13, 16, 17 and 20-24 are pending in the application. Claims 1-3, 6, 7, 10-13, 16, 17 and 20-24 stand rejected. Claims 4-5, 8-9, 14-15 and 18-19 are canceled. Claims 1, 7, 11, and 17 are amended herein. No new matter is added. Applicant respectfully requests reconsideration in view of the amendment and further in view of the following remarks.

Rejection Under 35 U.S.C. §103(a) over Knox, et al. in view of Fischer, et al.

The Examiner has rejected claims 1-3, 6-7, 10-13, 16-17 and 20-24 under 35 U.S.C. §103(a) as allegedly being unpatentable over Knox et al., U.S. Pat. No. 4,927,669 in view of Fischer, et al. U.S. Pat. No. 5,292,480.

The Examiner finds that Knox et al. discloses adding maleated fatty acids neutralized with imidazoline (amine) to a fluid in an amount of 750 and 6000 ppm of said fluid. The drag reducing function and an amount of the additive effective to reduce drag would have allegedly been inherent to the methods and compositions of Knox et al. since the methods and compositions are contended to read on and otherwise anticipate by the additive and the addition thereof, i.e., method steps and concentrations read on their use as corrosion inhibitor. The Examiner finds that the instant claims do and the instant disclosure does not preclude the inherent function of the instant claims from the ability to perform a corrosion inhibiting function as well as a drag reducing function.

The Examiner additionally contends that the relationship of the drag reduction as a function of concentration would have been expected to have at least a minimum threshold to function, which would be above 100 ppm as the lower limit claimed. The Examiner asserts that the relationship would be expected result in decreasing drag with increasing agent concentration to a maximum threshold. The Examiner notes

that the claims require a reduction in drag and an effective amount to achieve said reduction. Since the reference adds the same agent at the upper end of Applicants' concentration range, the Examiner alleges that it is reasonable to conclude that said concentration is inherently an effective amount to reduce drag.

To the extent the 750 ppm does not include the amount of imidazoline base, the Examiner asserts that a stoichiometric amount of imidazoline base (MW ~70) would result for a maleated fatty acid (MW ~400) in a concentration of less than 1000 ppm claimed (750 gm/kg / 400 gm/mol MW Acid x 470 gm/mol Acid + Base ~880 ppm.

The Examiner admits that Knox et al. *differs* from the claims in the requirement that the addition be continuous.

The Examiner finds that Fischer, et al. discloses related acid anhydride esters as corrosion inhibitors for oil field down hole use. The Examiner notes that Fischer, et al. in columns 8 and 12 shows that the continuous addition of corrosion inhibitors in down hole applications employing the Knox et al. class of corrosion inhibitors is known in the corrosion inhibiting art to those having ordinary skill in the art.

The Examiner finds that the references are combinable since they teach maleanized fatty acids as corrosion inhibitors in oil field down hole applications. The Examiner contends that it would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to add the corrosion inhibitors taught by Knox et al. continuously to maintain the corrosion protection in the oil field application shown to be conventional for said utility in the Fischer, et al. reference.

The Examiner responded to the Applicants' arguments by noting the Applicants assert that Knox, et al. teaches 750-6000 ppm of the corrosion inhibitor additives and the claims are now limited to 150-600 ppm. The Examiner did not find this persuasive since the claims employ open transition language, i.e., "comprising"; the amounts are modified by "about", the claims require a drag reducing effective amount, and said ranges have not been shown to be unobvious over the use of the same materials as corrosion inhibitors. The Examiner asserts that the relationship of the drag reduction as a function of concentration would have been expected to have at least a minimum threshold to function, which would be above 100 ppm as the

lower limit claimed. The relationship would be expected [to] result in decreasing drag with increasing agent concentration to a maximum threshold. The Examiner notes that the claims require continuous addition of drag reducing agent for the reduction in drag. The Examiner contends that since the reference adds the same agent at the upper end of Applicants' concentration range, it is reasonable to conclude that said concentration is inherently an effective amount to reduce drag. The Examiner alleges that the claims do not exclude the further addition for the function of corrosion inhibition.

The Examiner further finds that Applicants' specification asserts typical use levels for drag reducing agents is 5 to 10 times higher than corrosion inhibitors and the ranges are merely exemplary, and that Applicants have not shown said range to be patentably distinct from the ranges disclosed in the references.

Additionally, the Examiner finds that Fischer, et al. teaches it is conventional to add continuously further corrosion inhibitors and thus maintain a minimum threshold for the system. Since systems vary in both desired drag reduction and corrosion susceptibility and the corrosion inhibitors are used up in the system over time, the amount of additive would vary from system to system. The Examiner thus contends that it is within the level of one of ordinary skill in the art to determine the minimum effective amount of the additive for the corrosion inhibiting function for a particular system for the advantage of minimizing corrosion, associated corrosive scale and associated reduced flow from said corrosive scale.

The Applicants must again respectfully traverse.

To support an obviousness rejection, the Examiner has the initial burden of establishing a *prima facie* case of obviousness of the pending claims over the cited prior art, *In re Oeticker,* 977 F.2d 1443, 1445; 24 U.S.P.Q.2d 1443 (Fed. Cir. 1992).

The claimed invention herein concerns implementing drag reduction in fluids. It is well known that drag reduction means that a given fluid creates a given amount of drag in a given conduit at a given flow rate, and that the goal is to reduce, lower, lessen, diminish and/or otherwise decrease the drag from these starting conditions whatever they may be. By definition, drag reduction in fluids requires that the fluids

be flowing; if the fluid is not flowing, there is no drag, and no friction loss, and thus no need to reduce the drag. It is well known that chemical agents added to fluids to reduce drag and friction (drag reducing agents or DRAs) begin their work and impart their effect when they are added to the fluid, although it is recognized that it takes some relatively short amount of time for the DRAs to dissolve and become effective. Furthermore, all commercial implementation of reducing drag in flowing fluids requires that the fluid move from one point to at least a second, distant point – otherwise there would be no reason for transporting or flowing the fluid. Reducing drag of flowing fluids occurs in loops only for test purposes, such as in Example 2 of the instant application. There is no commercial advantage (or sense) to pumping crude oil around in circles.

Corrosion in the interior of a pipeline, tubing or other conduit may increase drag due to the increase in roughness of the surface over which the fluid passes when it is flowing. However, corrosion is a phenomenon that takes a relatively long time. While a corrosion inhibitor assists the drag of a flowing fluid by inhibiting or preventing future corrosion and thus a rough interior surface from occurring, a corrosion inhibitor *per se* can do nothing to *relatively quickly* reduce the drag or friction or increase the flow of a fluid in a pipeline or conduit *whether or not corrosion is already present*. Indeed, a corrosion inhibitor *does not remove* corrosion (*e.g.* roughness and/or scaled surfaces) and thus improve flow, rather a corrosion inhibitor only inhibits or prevents corrosion *in the future* that may increase drag. This is *not* the same as reducing drag that presently exists. These basic differences between these two additives and how they function and the phenomena they affect must be appreciated; if they are not, then the descriptive language of the claims has no meaning.

The Applicants would respectfully direct the Examiner's attention to the amendment to the specification paragraph [0022] (page 6, lines 16 and 18) where the apparent and obvious error of the word "~~higher~~" has been changed to "lower" at two occurrences. That this is an error is apparent from the more specific language in the sentence at lines 16-21: "The *typical use levels in the actual system for drag reduction is approximately **5-10** times ~~higher~~ lower than that for corrosion inhibition,*

based on total system fluid, *i.e.* from about 100 to 1000 ppm for methods of this invention, *preferably from about 150 to about 600,* and most preferably from about 200 to about 500 ppm." (Emphasis added.) The first sentence in this paragraph reads: "Compounds such as these are also known corrosion inhibitors (*e.g.* US Patent Nos. *4,927,669;* 5,385,616; 5,582,792) that have been used extensively." (Emphasis added.) Note that U.S. Pat. No. 4,927,669 is the Knox et al. reference herein. Please also note that 150 ppm is exactly ***5*** times lower than (1/5) the 750 ppm level in the third column of Table I of Knox et al., and 600 ppm is exactly ***10*** times lower than (1/10) the 6000 ppm level in the last column of Table I of Knox et al., respectively. Applicants respectfully submit that it is not accidental or coincidental that these numbers calculate this way. It is thus respectfully submitted that the more specific, numeric values given in paragraph [0022] should control and "~~higher~~" should be properly changed to "lower". It is further respectfully submitted that this error is apparent and inadvertent. The Applicants apologize for any confusion that may have occurred.

The Applicants would respectfully direct the Examiner's attention to the amendments to all of the independent claims herein 1, 7, 11, and 17, from which all other claims depend and incorporate by reference. In the second line of each of claims 1 and 7 "~~providing~~ a fluid" has been changed to "continuously flowing a fluid". This emphasizes the nature of reducing drag, *i.e.* that it occurs in a flowing fluid, not one at rest. Support for this language is found in the following places in the application as originally filed and thus does not constitute an improper insertion of new matter: paragraph [0001], page 1, lines 4-5; paragraph [0012], page 3, lines 4-5; and elsewhere. Similarly, composition claims 11 and 17, the second lines of each, have been amended to recite "a continuously flowing fluid".

The Examiner's attention is also respectfully directed to the fact that method claim 1, line 3 and method claim 7, line 5 have been amended to change "~~effective to reduce~~" to "thereby reducing"; and that composition claim 11, line 3 and composition claim 17, line 5 have been amended to change "~~effective to reduce~~" to "that reduces". The new language more positively specifies drag *reducing* in the case of the method claims, and that the additive *reduces* drag in the continuously flowing

fluid of the composition claims. This language further distinguishes the claimed invention from any method or composition having to do with corrosion inhibition. Applicants are of the position that the original language was sufficient to make this distinction, but that this new phrasing may help strengthen the distinction. Support for this more active language, if necessary, is found in the application as originally filed at: paragraph [0012], page 3, lines 1-2; Examples 1-2, paragraphs [0025-0027], page 8, line 14 to page 7; and elsewhere, and thus does not constitute an improper insertion of new matter.

The Examiner's attention is further respectfully directed to method claim 1, lines 4-5; method claim 7, lines 6-7; composition claim 11, lines 4-5; and composition claim 17, lines 6-7, where it is noted that drag is reduced "as compared with the absence of the additive". Support for this language is found in the application as originally found in Example 1 where the additives maleated fatty acid A and the maleated fatty acid ester thereof B all gave reductions in torque over the blank (no additive), thus demonstrating drag reducing using the additives of the invention. Thus, this language does not constitute an improper insertion of new matter. Applicants are of the opinion that this language is redundant, but nevertheless now makes it explicitly clear that the additive is reducing the drag of the fluid to which it is added; that is, the fluid has some initial level of drag and that level is reduced.

And lastly the Examiner's attention is respectfully directed to the last two lines in each independent claim 1, 7, 11, and 17 where the word "about" has been deleted from the phrase "where the amount of additive based on the total amount of fluid ranges from ~~about~~ 150 to ~~about~~ 650 ppm" to more clearly define the endpoints of the range.

It is respectfully submitted that one having ordinary skill in the art seeking to improve the flow of fluid through a conduit, in a non-limiting instance crude oil containing water through a pipeline, where the improvement is needed relatively soon, and whether or not there was corrosion-caused roughness and whether or not there was the potential for corrosion in a pipeline, would not be motivated or inclined or think to look to the corrosion inhibitor art for relevant teachings. The only reason that Knox, et al. is relevant to the instant claims is because the compounds are similar,

which the Applicants stipulate in paragraph [0022] of the application as originally filed. There is no teaching in Knox, et al. or Fischer, et al. taken alone or together that teaches or suggests that the Knox, et al. compounds or similar compounds have any utility whatsoever in reducing the drag that already exists of a continuously flowing fluid, much less continuously adding such compounds, much less continuously adding said compounds at levels considerably lower than taught by Knox, et al. It is respectfully submitted that a *prima facie* case for obviousness has not been made from the references of record.

Knox et al. only teaches and suggests using their corrosion inhibition formulations in the range of 750 to 6000 ppm, as the Examiner notes in Table I of the reference.

It is respectfully noted that the amounts given in Table I of Knox, et al. noted by the Examiner are these initial, one-time, batch, single dosage amounts consistent with customary corrosion inhibition procedures, and are not continuous applications as presently claimed. Further, the Knox, et al. amounts are greater than those now recited in the amended claims. The Applicants again respectfully submit that the combination of Knox et al. with Fischer, et al. do not teach or suggest that the instantly claimed additives should be added *continuously* to the fluids treated in an amount of *from 150 to 600 ppm.*

Because neither Knox, et al. nor Fischer, et al. have anything to do with providing drag reduction to the claimed fluids, they do not and cannot disclose, suggest or teach an effective proportion range for drag reduction for the explicitly claimed additives, much less the proportion range of from 150 to 600 ppm. There is no discussion, disclosure, suggestion or hint in either reference that roughness caused by corrosion would adversely affect the flow of the fluid through a conduit or pipeline. This supposed nexus is missing from the record. Thus, it is respectfully submitted that the claims as amended are not obvious from the teachings of Knox, et al. and/or Fischer, et al. taken singly or together.

Further, although the Applicants stipulate that both references relate to corrosion inhibitors used in oil field down hole applications, it is respectfully submitted that there is no reasonable expectation that if the Knox et al. inhibitor formulations were

added continuously as Fischer, et al. add theirs that the Knox, et al. inhibitor formulations would perform effectively. "The teaching or suggestion to make the claimed combination *and reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. In re Vaeck*, 947 F.2d 488, 493, 20 U.S.P.Q.2d 1438, 1442 (Fed. Cir. 1991)." [MPEP §2143, emphasis added.]

"Our reviewing courts have often advised the Patent and Trademark Office that it can satisfy the burden of establishing a *prima facie* case of obviousness *only* by showing some *objective* teaching in either the prior art, or knowledge generally available to one of ordinary skill in the art, that 'would lead' that individual 'to combine the relevant teachings in the references.' Accordingly, an examiner *cannot* establish obviousness by locating references which describe aspects of a patent applicant's invention without *also* providing *evidence of the motivating force which would impel one skilled in the art to do what the patent applicant has done.*" [Citations omitted; emphasis added.] *Ex parte Levengood*, 28 U.S.P.Q.2d 1300, 1302 (B.P.A.I. 1993).

The Applicants herein respectfully submit that there is no such reasonable expectation of success herein since there is nothing in the references that discloses, teaches, directs or impels that *the Knox et al. corrosion inhibition formulations* should be added *continuously* to reduce drag by any method. Furthermore, there is no reasonable expectation or motivating force that would impel one having ordinary skill in the art to know the Knox et al. corrosion inhibition formulations would function as drag reducers when added *continuously* in an amount of additive *from 150 to 600 ppm* based on the total amount of fluid, or impel such one to practice such a method.

As such, since the references taken alone or together do not teach or suggest the claims, as amended, for all of these reasons, the rejection must fall. It is respectfully submitted that a *prima facie* obviousness rejection has not been made. Reconsideration is respectfully requested.

Request for Entry of Amendment

The Applicants would respectfully submit that the instant Amendment be entered under 37 CFR §1.116(b): "Amendments presenting rejected claims in better form for consideration on appeal may be admitted." It is respectfully noted that all of

the independent claims have been amended herein in numerous ways to clarify the language and focus it more precisely on reducing drag in a flowing fluid, and to make it clear the starting point from which drag is reduced. It is respectfully submitted that all of the amendments discussed *supra* simplify and narrow the issues and put the claims in better condition for appeal, and thus the instant Amendment should be entered.

Further, the Applicants would respectfully submit that the instant amendment be entered under 37 CFR §1.116(c): "If amendments touching the merits of the application or patent under reexamination are presented after final rejection, or after appeal has been taken, or when such amendment might not otherwise be proper, they may be admitted upon showing of good and sufficient reasons why they are necessary and were not earlier presented." The Applicants submit that the reason why the amendments and arguments above are necessary and were not earlier presented is simply because many of the rejection points addressed were not earlier presented, before the final rejection and/or the teleconference between the Examiner and the Applicants' attorney. It did not occur to the Applicants that when the additive reduces drag of the fluid was an issue or the baseline for drag improvement should be addressed. Applicants were and are of the position that these were self-evident from the context of the invention. The Applicants are glad to discuss them and amend the claims to address these concerns, but for the Applicants to have any hope of being assured of a chance to address the points, the amendments and arguments herein must be entered and considered. Applicants respectfully submit that it would be inequitable for Applicants to not have a chance to address the new points made in the final rejection.

It is respectfully submitted that the amendments and arguments presented above overcome the rejection. Reconsideration and allowance of the claims are respectfully requested. The Examiner is respectfully reminded of his duty to indicate allowable subject matter. The Examiner is invited to call the Applicants' attorney at the

number below for any reason, especially any reason that may help advance the prosecution.

Respectfully submitted,

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